



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,829	08/20/2003	Manojkumar Saranathan	GEMS8081.169	1828

27061 7590 03/09/2007
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

EXAMINER

SOLANKI, PARIKHA

ART UNIT PAPER NUMBER

3737

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/604,829

Applicant(s)

SARANATHAN ET AL.

Examiner

Parikha Solanki

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 22 December 2006, with respect to the rejection(s) of claim(s) 7-12 and 25-26 under 35 U.S.C. 101 have been fully considered but are not persuasive.

Applicant contends that pulse sequences and computer signals constitute statutory subject matter, and further contends that the previously-cited 1300 OG 142 fails to sufficiently state otherwise.

For further clarification regarding the prior rejection of claims 7-12 and 25-26, Examiner respectfully directs Applicant's attention to the following excerpts from the aforementioned Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, 1300 OG 142.

From page 55:

"(c) Electro-Magnetic Signals

Claims that recite nothing but the physical characteristics of a form of energy, such as frequency, voltage, or the strength of a magnetic field, define energy or magnetism per se, and as such are nonstatutory natural phenomena. 'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101."

From page 57:

"A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101 ... such signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of § 101."

(Source:

http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf)

The pulse sequence and computer signal claimed by Applicant in claims 7-12 and 25-26, respectively, do not constitute tangible, physical articles or objects as set forth above. As such, Examiner maintains that the current recitations of claims 7-12 and 25-26 render the claimed

Art Unit: 3737

invention non-statutory. Examiner accordingly reiterates the rejection of these claims under 35 U.S.C. 101 below.

2. Applicant's arguments, filed 22 December 2006, with respect to the double-patenting rejection(s) of claim(s) 1-26 under 35 U.S.C. 101 have been fully considered and are persuasive. Accordingly, the double patenting rejection of claims 1-26 is hereby withdrawn.

3. Applicant's arguments, filed 22 December 2006, with respect to the rejection(s) of claim(s) 1-5 and 7-26 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Parker et al (Improved Efficiency in Double-Inversion Fast Spin-Echo Imaging. *Magnetic Resonance in Medicine* 47:1017-1021. May 2002.).

4. Applicant's arguments and corrections, filed 22 December 2006, with respect to the objection(s) to the specification and abstract have been fully considered and are sufficient to overcome these objections. Accordingly, the prior objections to the specification and abstract are hereby withdrawn. Examiner also withdraws the prior objection to the drawings as not showing all limitations of the methods of claims 3-12.

Applicant contends that the objection to element 110 as described in the specification should be withdrawn because the disclosures of paragraphs 23 and 24 recite the same character in the same figure, and as such it is not improper to refer to that element by different terms. Examiner maintains the objection to reference character 110 as set forth in the prior Office Action. Both ECG-gated and non-gated black blood techniques are known in the art, and as such the term "conventional" is not sufficient to imply that the sequence is ECG-gated, or vice versa. For the purposes of clarity, Examiner respectfully suggests that Applicant amend paragraphs 23 and 24 of the specification such that they recite consistent terminology for element 110.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Art Unit: 3737

6. Claims 7-12 and 25-26 are rejected under 35 U.S.C. 101 because the claimed inventions are directed to non-statutory subject matter.

Regarding claims 7-12, pulse sequences are electromagnetic signals, and are thereby classified as natural phenomena. As such, the inventions described by these claims do not meet the patent eligibility requirements set forth by 35 U.S.C. 101.

Regarding claims 25-26, a computer signal is neither a process, machine, manufacture nor a composition of matter. Therefore, the subject matter described in these claims is considered non-statutory and unpatentable. Applicant's attention is directed toward 1300 OG 142 for further detail regarding the basis of this decision.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 7-11, 13-16, 18-22, 25 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Parker et al (Improved Efficiency in Double-Inversion Fast Spin-Echo Imaging. *Magnetic Resonance in Medicine* 47:1017-1021. May 2002.), hereinafter Parker (2002).

Parker (2002) discloses a method and related system, including a pulse sequence, apparatus, and computer signal, for rapid multi-slice black blood double-inversion recovery. The invention of Parker (2002) includes means and steps for applying a non-selective inversion pulse in successive R-R intervals, applying a slice-selective re-inversion pulse in the successive R-R intervals, timing the execution of the RF excitation pulses such that the signal from the blood is near a null point in each R-R interval, and acquiring data for two slices in each R-R interval (Fig. 1d, p.1017 col. 2). Parker (2002) discloses that the slice selections may be made using a fast spin echo, and also alternates acquisition of two sets of slice selections (Fig. 1d, p.1017 col. 2). Parker also discloses means and steps for the acquisition of multiple-slice MR data in each heartbeat, wherein the slices acquired in a first heartbeat are different from those acquired during a next heartbeat (Fig. 1). The non-selective and selective inversion pulses of Parker (2002) are both 180-degree pulses (p. 1017 col. 2).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5, 6, 12, 17, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (2002) in view of Miyazaki (US Patent US Patent No. 6,144,201).

Parker (2002) does not expressly teach acquiring the MR data over a patient breath hold, and accordingly does not teach a number of slices to be acquired per breath hold. Parker does teach the acquisition of four slices of data per two heartbeats (Fig. 1). In the same field of endeavor, Miyazaki ('201) teaches patient breath-holds over 8 cardiac cycles for reducing motion artifact in the acquired MR image data (Fig. 4, col. 4 lines 34-41). It would have been obvious to one of ordinary skill in the art to modify the method of Parker (2002) to incorporate the breath-holding technique of Miyazaki ('201) to reduce motion artifact in the acquired MR data. Such a modification would thereby result in acquisition of more than one slice of data per breath hold as claimed in the instant application.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Foo et al (US Patent No. 6,498,946), Song et al (Multislice Double Inversion Pulse Sequence for Efficient Black-Blood MRI. *Magnetic Resonance in Medicine* 47:616-620. 2002), Pan et al (US PG Pubs. No. 2003/0069493) and Yarnykh et al (US PG Pubs. No. 2004/0181146) teach related means and steps for multi-slice double inversion black blood imaging. Fayad et al (US PG Pubs. No. 2005/0010104) and Mani et al (A new interleaved multi-slice black blood double inversion recovery technique for vessel wall imaging. *Proc. Intl. Soc. Mag. Reson. Med.* 10 July 2003) teach related systems and methods of multi-slice double inversion black blood imaging, wherein the pulse sequences are applied over successive R-R intervals.

Art Unit: 3737

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parikha Solanki whose telephone number is 571.272.3248. The examiner can normally be reached on M-F, 8 - 4:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Parikha Solanki

Examiner – Art Unit 3737


BRIAN L. CASLER
SUPERVISOR / ART UNIT EXAMINER
TELEPHONE 571-272-4956